CLAIMS

1. A communication apparatus which adopts a multicarrier modulation and demodulation technique, said communication apparatus comprising:

a transmitter unit which converts a transmission symbol to a half symbol and conducts communication in such a state that a predetermined power difference is given between even-numbered subcarriers and odd-numbered subcarriers which is interference components at time of demodulation, and

a receiver unit which conducts predetermined Fourier transform to extract even-numbered subcarriers on a received symbol converted to the half symbol, and demodulates data assigned to the subcarriers,

which, on the other hand, conducts inverse Fourier transform on the data assigned to the even-numbered subcarriers, and generates a first symbol formed of temporal waveforms of the even-numbered subcarriers,

which subsequently removes the first symbol component from the received symbol, generates a second symbol formed of temporal waveforms of odd-numbered subcarriers, and generates a third symbol by adding a symbol obtained by copying and inverting the second symbol, after the second symbol, and

which finally conducts predetermined Fourier

transform to extract odd-numbered subcarriers on the third symbol, and demodulates data assigned to the subcarriers.

2. The communication apparatus according to claim 1, wherein the receiver unit conducts inverse Fourier transform on data assigned to the odd-numbered subcarriers, generates a fourth symbol formed of temporal waveforms of odd-numbered subcarriers, then removes the fourth symbol component from the received symbol, and thereafter conducts demodulation processing by using the received symbol with the fourth symbol component removed.

3. The communication apparatus according to claim 1 or 2, wherein

the transmitter unit spreads (multiplexes) transmission data assigned to a (2i-1)th subcarrier and a 2ith subcarrier which are adjacent to each other, with a predetermined spreading code, conducts inverse Fourier transform on the signal subjected to the spreading, and thereby generates the transmission symbol, and

the receiver unit despreads (demultiplexes) the demodulated data with the spreading code, and reproduces original transmission data assigned to the (2i-1)th subcarrier and the 2ith subcarrier which are adjacent to each other.

4. A communication apparatus functioning as a transmitter which adopts a multicarrier modulation and demodulation technique, said communication apparatus comprising:

a transmitter unit which converts a transmission symbol to a half symbol and conducts communication in such a state that a predetermined power difference is given between even-numbered subcarriers and odd-numbered subcarriers which is interference components at time of demodulation.

5. The communication apparatus according to claim 4, further comprising a multiplexing unit which spreads (multiplexes) transmission data assigned to a (2i-1)th subcarrier and a 2ith subcarrier which are adjacent to each other, with a predetermined spreading code,

wherein the transmitter unit conducts inverse Fourier transform on the signal subjected to the spreading, and thereby generates the transmission symbol.

6. A communication apparatus functioning as a receiver which adopts a multicarrier modulation and demodulation technique, said communication apparatus comprising:

a first demodulation unit which conducts predetermined Fourier transform to extract even-numbered subcarriers on

a received symbol converted to the half symbol, and demodulates data assigned to the subcarriers,

a first symbol generation unit which conducts inverse Fourier transform on the data assigned to the even-numbered subcarriers, and generates a first symbol formed of temporal waveforms of the even-numbered subcarriers,

a second symbol generation unit which removes the first symbol component from the received symbol, and generates a second symbol formed of temporal waveforms of odd-numbered subcarriers,

a third symbol generation unit which generates a third symbol by adding a symbol obtained by copying and inverting the second symbol, after the second symbol, and

a second demodulation unit which conducts predetermined Fourier transform to extract odd-numbered subcarriers on the third symbol, and demodulates data assigned to the subcarriers.

7. The communication apparatus according to claim 6, further comprising:

a fourth symbol generation unit which conducts inverse Fourier transform on data assigned to the odd-numbered subcarriers, and generates a fourth symbol formed of temporal waveforms of odd-numbered subcarriers, and

a removal unit which removes the fourth symbol

component from the received symbol,

wherein thereafter demodulation processing is conducted by using the received symbol with the fourth symbol component removed.

8. The communication apparatus according to claim 6, further comprising:

a demultiplexing unit which despreads (demultiplexes) the demodulated data, and reproduces original transmission data assigned to the (2i-1)th subcarrier and the 2ith subcarrier which are adjacent to each other.

9. A communication method which adopts a multicarrier modulation and demodulation technique, the communication method comprising:

a transmission step which converts a transmission symbol to a half symbol and conducts communication in such a state that a predetermined power difference is given between even-numbered subcarriers and odd-numbered subcarriers which is interference components at time of demodulation,

a first demodulation step which conducts predetermined Fourier transform to extract even-numbered subcarriers on a received symbol converted to the half symbol, and demodulates data assigned to the subcarriers,

a first symbol generation step which conducts inverse Fourier transform on the data assigned to the even-numbered subcarriers, and generates a first symbol formed of temporal waveforms of the even-numbered subcarriers,

a second symbol generation step which removes the first symbol component from the received symbol, and generates a second symbol formed of temporal waveforms of odd-numbered subcarriers,

a third symbol generation step which generates a third symbol by adding a symbol obtained by copying and inverting the second symbol, after the second symbol, and

a second demodulation unit which conducts predetermined Fourier transform to extract odd-numbered subcarriers on the third symbol, and demodulates data assigned to the subcarriers.

10. The communication method according to claim 9, further comprising:

a fourth symbol generation unit which conducts inverse Fourier transform on data assigned to the odd-numbered subcarriers, and generates a fourth symbol formed of temporal waveforms of odd-numbered subcarriers, and

a removal step which removes the fourth symbol component from the received symbol,

wherein thereafter demodulation processing is

conducted by using the received symbol with the fourth symbol component removed.

11. The communication method according to claim 9, further comprising:

a multiplexing step which spreads (multiplexes) transmission data assigned to a (2i-1)th subcarrier and a 2ith subcarrier which are adjacent to each other, with a predetermined spreading code, conducts inverse Fourier transform on the signal subjected to the spreading, and thereby generates the transmission symbol, and

a demultiplexing step which despreads (demultiplexes) the demodulated data with the spreading code, and reproduces original transmission data assigned to the (2i-1)th subcarrier and the 2ith subcarrier which are adjacent to each other.